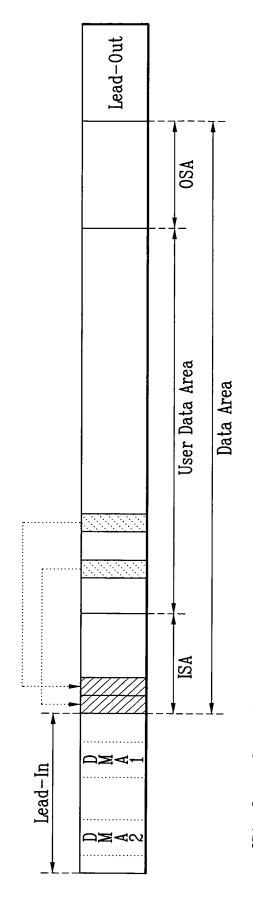
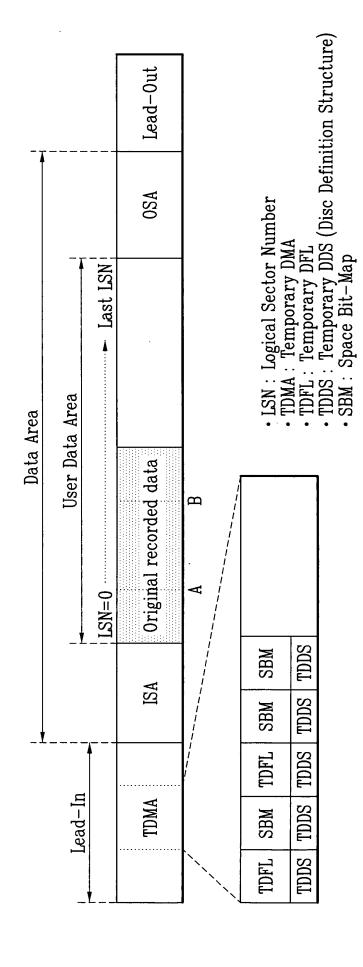
FIG. 1 Related Art



ISA: Inner Spare AreaOSA: Outer Spare AreaDMA: Defect management Area

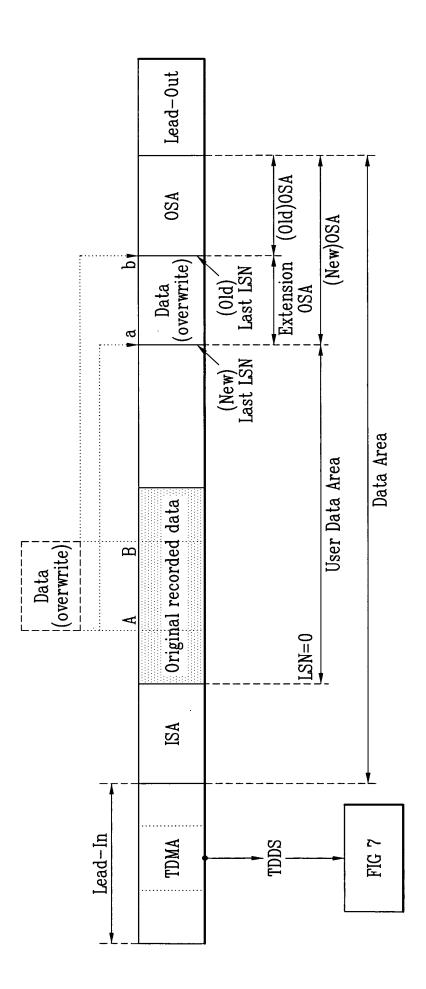
Defective cluster in User Data Area Replacement cluster in Spare Area

FIG. 2

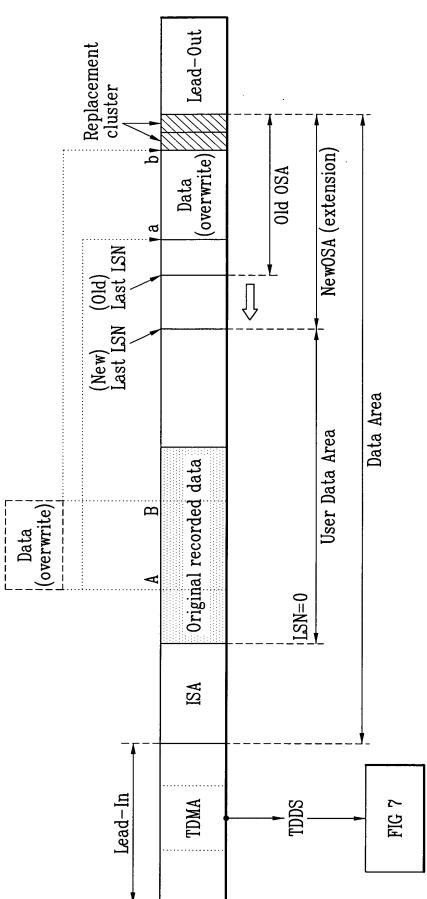


Lead-Out FIG 3B 0SA (old) Last LSN Data (overwrite) b (Old) Last LSN (New) / Last LSN Data Area User Data Area FIG. 3A FIG. 3B Original recorded data | Data |(overwrite) В 1 cluster (New) Last LSN ISN=0 ISA Lead-In TDMA TDDS FIG 7

FIG. 4



(New) (Old) Last LSN Last LSN FIG. 5 Data (overwrite) Lead-In



Lead-Out 0SA Data (overwrite) Last LSN Last LSN of usable user data <u>م</u> ಹ area User Data Area Original recorded data | Data |(overwrite) Щ ISN=0 ISA Lead-In TDMA TDDS

Data Area

FIG 8

FIG. 6

FIG. 7

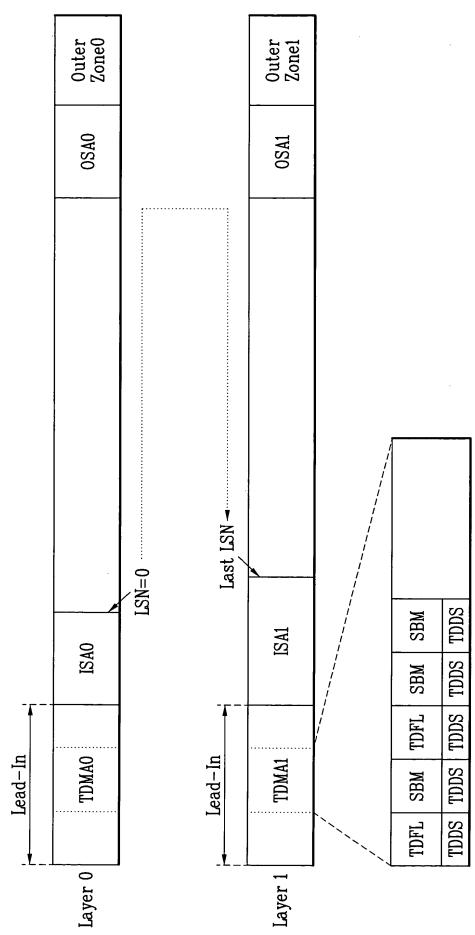
TDDS

TDDS identifier = "TDS"
TDDS update counter
•
Location LSN=0 of User Data Area
Location (new) Last LSN of User Data Area
÷

FIG. 8

TDDS

TDDS identifier = "TDS"
TDDS update counter
•
Location LSN=0 of User Data Area
Location Last LSN of User Data Area
Location Last LSN of usable User Data Area



Outer Zone0 Outer Zone1 OSA0 0SA1 (Old) (New)
Last LSN Last LSN -Data (overwrite) \Box Original recorded data p Data (overwrite) ပ LSN=0 ပ ISA1 ISA0 Lead-Out TDMA0 Lead-In TDMA1 FIG 7 TDDS Layer 0 Layer 1

FIG. 10

Outer Zone0 Outer Zone1 OSA0 0SA1 Last LSN of usable user data Area Q Data (overwrite) Original recorded data FIG. 11 Last LSN -Data (overwrite) ပ I.SN=0 ပ ISA1 ISA0 Lead-Out TDMA0 Lead-In TDMA1 FIG 8 TDDS Layer 0 Layer 1

Outer Zone0 Outer Zone1 0SA0 0SA1 (New) (old)
Last LSN Last LSN
of Layer 0 of Layer 0 Data 1 (overwrite) þ ಹ (New) Last LSN of Layer 1 Data 2 (overwrite) Original recorded data FIG. 12 B Data 2 (overwrite) Data 1 (overwrite) I.SN=0 (01d) Last LSN of Layer 1 A ပ ISA1 ISA0 Lead-Out TDMA0 Lead-In TDMA1 FIG 14 TDDS Layer 0 Layer 1

Outer Zone0 Outer Zone1 0SA0 0SA1 ..**_** Data 1 (overwrite) **A** Last LSN of usable user data Area of Layer 0 Last LSN of usable user data Area of Layer1 Data 2 (overwrite) Original recorded data FIG. 13 ပ Data 2 (overwrite) Data 1 (overwrite) Щ LSN=0 Last LSN ISA1 ISA0 TDMA0 Lead-Out Lead-In TDMA1 TDDS Layer 0 Layer 1

FIG 15

FIG. 14

TDDS

TDDS identifier = "TDS"
TDDS update counter
•
Location LSN=0 of User Data Area
Location (new) Last LSN of User Data Area of Layer 0
Location (new) Last LSN of User Data Area of Layer 1

FIG. 15

TDDS

TDDS identifier = "TDS"
TDDS update counter
: :
Location LSN=0 of User Data Area
Location Last LSN of User Data Area of Layer 0
Location Last LSN of User Data Area of Layer 1
Location Last LSN of usable User Data Area of Layer 0
Location Last LSN of usable User Data Area of Layer 1
÷

